

# Challenges in prevention, diagnosis and treatment of abdominal wall hernias

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## Introduction

Valorisation is the process of creation of value from knowledge, by making knowledge suitable and available for social and/or economic use and by translating knowledge into competitive products, services, processes and new commercial activities. This addendum discusses the social and economic value of the results described in this thesis for both the general patient population as well as the quality of life of the individual patient.

Health care providers may apply the findings of this thesis in their clinical and scientific practice. A final relevant target audience are health care managers, insurance companies and policy makers, as they can apply the findings to improve resource management and allocation within the health care system.

## Scope

Several types of abdominal wall hernias are discussed in this thesis: incisional and parastomal hernias are more common and lumbar and arcuate line hernias are rare abdominal wall hernias.

Incisional hernia and parastomal hernia are iatrogenic types of hernias that can arise after abdominal surgery. Up to two in ten patients who had a laparotomy develop an incisional hernia and in certain types of ostomies, up to one in two patients develop a parastomal hernia. Presence of obesity and smoking increases the likelihood of hernia development. Each year approximately 5500 colostomies are created in the Netherlands and ventral abdominal hernia repair remains one of the most commonly performed surgical procedures; 3 million hernia repairs are performed each year in the world. Convalescence after abdominal wall hernia repair may be complicated by surgical site infections, bowel injury or recurrence of the hernia.

The incidence of lumbar hernias and arcuate line hernias is much lower. These types of abdominal wall hernias may well be classified as a rare disease as defined by the European Commission on Public Health: 'Life-threatening or chronically debilitating diseases which are of such low prevalence that special combined efforts are needed to address them.' Low prevalence is generally meant to be fewer than 1 in 2000 people.

## Personal and societal impact

Individual patients with abdominal wall hernias may experience bulging, discomfort or pain related to the hernia, as well as cosmetic complaints. Incarceration or strangulation of the hernia may occur, which can cause mortality if untreated. Parastomal hernias can cause leakage of effluent that leads to skin irritation and inflammation, besides incarceration also leading to mortality if not treated. These symptoms impair quality of life of patients and inhibit their ability to fully use their occupational potential, which may result in poorer employment opportunities. Surgical treatment of abdominal wall hernias is not without risks for the patient. Postoperative complications such as recurrence of the hernia, infection and in extreme cases mortality can occur. Lifestyle interventions such as preoperative weight loss and smoking cessation may decrease the risk of incisional hernia formation and decrease risk of postoperative complications. Shared decision making with patients is increasingly important in abdominal wall surgery.

Abdominal wall hernias burden the resources of society in several ways. First, patients with abdominal wall hernias have an impaired productivity, when compared to patients without abdominal wall hernias. Second, unemployed patients with abdominal wall hernias will also seek to gain disability benefits, which are provided by general society. Third, patients with incisional hernia and parastomal hernia seek relief and treatment for these complaints which leads to an increased health care consumption by increased health care consultations, use of supportive devices and surgical revision of the hernia. This in turn leads to a larger economic burden of the general health care system for society. In France, a multi-center study assessed the annual cost for ventral hernia repair at 45 million Euros. A saving of 4 million Euros was estimated if a 5% reduction of incisional hernia incidence could be achieved.

With these figures in mind, the potential gains of prevention of incisional hernia formation and improved supportive treatment of parastomal hernia are huge. Individual quality of life of patients will improve and general health care consumption will decrease. Part A of this thesis is focused on this subject.

## Prevention

Chapter 2 is in essence a quality control audit of current implementation of best evidence techniques for prevention of incisional hernia development. Unfortunately, the findings are that for various reasons most surgeons do not currently use best

evidence techniques for incisional hernia prevention. While incisional hernia development is dependent on a variety of reasons, surgical technique and materials are directly adaptable and these findings suggest that significant decreases in incisional hernia rates are achievable if all surgeons adapt the current best techniques.

Likewise, optimization of preventative strategies for incisional hernia formation will reduce the incidence and thus less socio-economic impact of this condition. Chapter 3 investigated a potential preventative strategy for incisional hernia formation by use of two different suture materials for closure of the abdominal fascia after midline laparotomy.

Chapter 4 focuses on a new ostomy dressing (TOMAS) that omits adhesive fixation on the skin. Less disposable materials are used in this dressing which leads to a smaller environmental and economic burden for patients and society. The exact economic impact of the device will have to be examined in future studies.

## Diagnosis and treatment

In part B of this thesis, diagnosis and treatment of abdominal wall hernias is discussed. Chapter 5 found that the combined use of structured physical examination and ultrasonography yielded a significant number of, mostly asymptomatic, hernias which would not be found by physical examination alone. This is relevant for future research in incisional hernia to adequately detect all incisional hernias, which in turn leads to improved quality of research that can better be applied in clinical care for patients.

Chapters 6, 7 and 8 focus on more rare abdominal wall hernias, the arcuate line hernia and the lumbar dorsal hernia. While these types of abdominal hernias have a low incidence and have little general socio-economic impact, the consequences of having a symptomatic or even incarcerated rare abdominal wall hernia can be immense for individual patients. The research presented in these chapters can help patients suffering from one of these rare abdominal wall hernias. Furthermore, improving knowledge on diagnosis and treatment of these hernias can translate into future knowledge of more common types of hernias which affect larger number of patients.

## Conclusion

Abdominal wall hernias, both common and rare, have a large socioeconomic impact on individual patients and society in general. The content of this thesis helps to prevent hernia formation and to optimize treatment of these hernias. Hopefully this benefits

individual patients and decreases health care consumption. Ongoing research in this field is thus necessary and valuable.